

Scenario discussion:

Several individuals discussed the methods used to determine the penetration levels for our scenarios. The TRC discussed how assumptions like the cost of solar PV and state RPS and incentives (economic development and consumer) might influence penetration levels. The group discussed doing additional ReEDS simulations to determine how these constraints might influence the study.

There was also a discussion of the use of a national and regional scenario. Some parties indicated that a national policy that encourages the use of high class resources and a large transmission build out may never happen. Others argued that Congressional action to force a national carbon or renewables standard could happen at any time. Participants agreed that a national and regional scenario would book end the operational impacts to two different approaches to meeting a 30% wind and solar penetration requirement.

NREL Response: The team will continue to evaluate the operational impacts of a national and regional scenario for 30% wind and solar penetration. We will determine whether the existing data allows us to select identical wind and solar targets for both the national and regional scenario. We propose to determine the impact of solar pv prices and the impact of regional economic development on scenario development in 2014 when we propose new scenarios to investigate.

Wind and Solar Profile Discussion:

There were clarifying discussions on the wind profile data fix that was completed in 2012. EPRI representatives explained their willingness to share solar irradiance data with NREL to improve solar profile development in the Eastern Interconnection

NREL Response: The team will work with EPRI to obtain irradiance data to refine solar profiles for future scenarios.

Generator Properties Discussion:

The group discussed the basis for our thermal fleet generation properties. The team explained that the assumptions were taken from EIPC. The team also proposed to use cost estimates from Intertek APTECH to capture cycling V&OM costs. The data for the heat rates will come from the EPA CEMs database.

The group also discussed how these assumptions, particularly the CT full load heat rate, and which resources are allowed to provide reserves, could drive our results. These items were noted for further discussion in the working group. Members of the group explained that partial heat rates on CTs would dramatically increase solve time, and was a driving consideration in the CT assumptions for EIPC.

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The topic of nuclear ramping and cycling were discussed in detail. There are reports of some nuclear plants going to historically low operating points because of low gas prices driving down LMPs. The group discussed what operating limits could be used in the study, and suggested making this a discussion topic for the generation working group. The group also discussed whether wind could provide ramp down regulation service. The team replied that the sources of reserves is easily controlled in plexos, but adding more reserve products and resources increases solve time, sometimes significantly. The TRC agreed that the topic should be addressed in detail in a working group.

NREL Response: The team agreed to create a generation working group to create thermal and hydro assumptions for use in plexos. These assumptions will closely follow those of EIPC. Special attention will be paid to how these assumptions can drive results, and what operating characteristics should be for nuclear and other resources. The team will discuss the impact of natural gas fuel prices and resources eligible to provide reserves on the results at these working groups.

Transmission Modeling Discussion:

The group discussed ways to reduce the solve time for plexos. Because of the number of buses in the Eastern Interconnection, some simplifications to the transmission model will be necessary to reduce the solve time. Everyone that spoke agreed that running a full nodal model would be too difficult at this time. There were a variety of proposals made to simplify the system. Some included only monitoring transmission greater than a certain kv. Others would have us run a full nodal simulation for each region using an interchange supply curve. Using flowgates between the regions appeared to be the preferred approach by many on the call. The TRC encouraged us to base our transmission modeling considerations on the type of study we are pursuing. Since this study is about operational impacts, perhaps exact detail of the transmission system isn't necessary for this type of analysis. The callers agreed a working group on this topic is essential.

NREL Response: The team is following the CEII process for obtaining transmission expansion and power flow data from EIPC. The team will also plan a series of working group meetings to determine how to model the transmission system for the scenarios.

Operational Impact Analysis Discussion:

Participants discussed the inclusion of demand response and price responsive load as mitigation options for the variability and uncertainty of the system. The group also discussed the potential study of storage or electric vehicles as mitigation strategies. There was also discussion of how Order No. 764 will impact the interchanges in the east and how changes in interchange practices may mitigate the uncertainty and variability of the system.

The impact of the Canadian system was also discussed. Participants agreed that a working group should be created to evaluate the relationship between the US and Canadian systems. Discussion topics included future US import practices and Canadian hydro units.

Another topic of interest was forecasting. There were several opinions given about improvements in forecasting and how updated forecasts can be used to improve the results of the SCUC/SCEC. The group discussed 4 hour ahead markets, and the various ramps that can be associated with wind and solar.

NREL Response: The team will create a Mitigation Strategies working group to investigate the various approaches that could be used to manage the variability and uncertainty of the system. Mitigation strategies may include ancillary services and reserves analysis, short term forecast integration for the SCUC and SCEC, interchange, and virtual trading.

Next Steps:

The group discussed the timing of the next two TRC meetings. Suggestions were made to coordinate these meetings with the EIA Energy Conference in Washington DC, June 17-18 and Solar Power International in Chicago, IL, October 21-24. The team will pursue planning the next TRC meetings in Washington and Chicago.

Conference call attendees:

Mark Ahlstrom	WindLogics
Jordan Bakke	MISO
Venkat Banunarayanan	DOE
Aaron Bloom	NREL
Greg Brinkman	NREL
Ben Carmichael	Southern Company Services
Nick Dumitriu	PJM Interconnection
Emily Fisher	LBNL
Richard Gilker	DOE
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Chris Habig	Southern Company
Stan Hadley	Oak Ridge National Lab
Jack King	reppae
Brendan Kirby	ConsultKirby
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